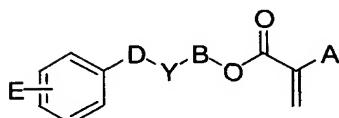
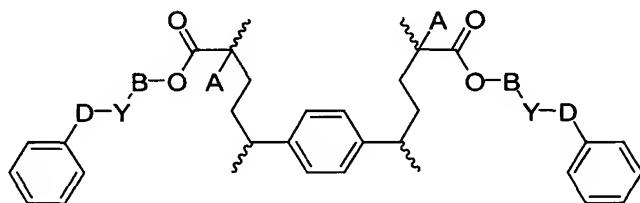


We claim:

1. A self-reinforced polymeric material comprising (a) a monofunctional acrylate or methacrylate monomer of formula (1), (b) a difunctional acrylate or methacrylate cross-linking monomer, and (c) a cross-linked acrylate or methacrylate microsphere of formula (2):



(1)



(2)

10

wherein:

A = H, CH₃, CH₂CH₃, CH₂OH;

B = (CH₂)_m or [O(CH₂)₂]_n;

15 D = (CH₂)_w;

m = 2 – 6;

n = 1 – 10;

Y is nothing, O, S, or NR, provided that if Y is O, S, or NR, then B is (CH₂)_m;

R is H, CH₃, C_nH_{2n+1} (n=1-10), iso-OC₃H₇, C₆H₅, or CH₂C₆H₅;

20 w = 0-6, provided that m+w ≤8; and

E is H, C₁ – C₄ alkyl, C₁ – C₄ alkoxy, C₆H₅, CH₂C₆H₅, or F, Cl, Br.

25 2. The polymeric material of Claim 1 wherein the material is made by radical polymerization of the monofunctional acrylate or methacrylate monomer of formula (1) and the difunctional acrylate or methacrylate cross-linking monomer in the presence of the cross-linked acrylate, or methacrylate microsphere of formula (2).

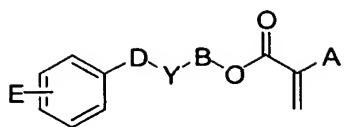
3. The polymeric material of Claim 1 wherein the difunctional acrylate or methacrylate cross-linking monomer (b) is selected from the group consisting of ethylene glycol dimethacrylate; diethylene glycol dimethacrylate; allyl methacrylate; 1,3-propanediol dimethacrylate; 2,3-propanediol dimethacrylate; 1,6-hexanediol dimethacrylate; 1,4-butanediol dimethacrylate; $\text{CH}_2=\text{C}(\text{CH}_3)\text{C}(\text{O})\text{O}(\text{CH}_2\text{CH}_2\text{O})_n\text{C}(\text{O})\text{C}(\text{CH}_3)=\text{CH}_2$ where n = 1 – 50; $\text{CH}_2=\text{C}(\text{CH}_3)\text{C}(\text{O})\text{O}(\text{CH}_2)_t\text{O}-\text{C}(\text{O})\text{C}(\text{CH}_3)=\text{CH}_2$ where t= 3 – 20; and their corresponding acrylates.

10 4. The polymeric material of Claim 1 wherein the polymeric material comprises 75 - 98% (w/w) of the monofunctional acrylate or methacrylate monomer of formula (1), 0.1 - 5 % (w/w) of the difunctional acrylate or methacrylate cross-linking monomer, and 1 – 20 % (w/w) of the cross-linked acrylate or methacrylate microsphere of formula (2).

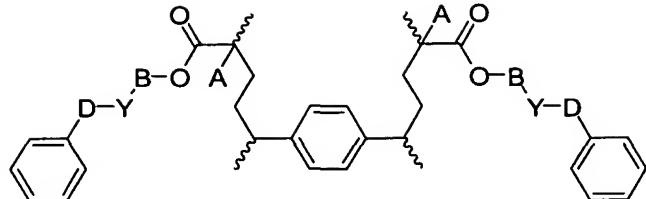
15 5. The polymeric material of Claim 4 wherein the polymeric material comprises 1 – 5 % (w/w) of the cross-linked acrylate or methacrylate microsphere of formula (2).

20 6. The polymeric material of Claim 1 wherein the material further comprises an ingredient selected from the group consisting of reactive UV absorbers and reactive blue-light absorbers.

25 7. An ophthalmic or otorhinolaryngological device selected from the group consisting of intraocular lenses; contact lenses; keratoprostheses; corneal rings or inlays; otological ventilation tubes; and nasal implants, wherein the device comprises a self-reinforced polymeric material comprising (a) a monofunctional acrylate or methacrylate monomer of formula (1), (b) a difunctional acrylate or methacrylate cross-linking monomer, and (c) a cross-linked acrylate or methacrylate microsphere of formula (2):



(1)



(2)

wherein:

- 5 A = H, CH₃, CH₂CH₃, CH₂OH;
- B = (CH₂)_m or [O(CH₂)₂]_n;
- D = (CH₂)_w;
- m = 2 – 6;
- n = 1 – 10;
- 10 Y is nothing, O, S, or NR, provided that if Y is O, S, or NR, then B is (CH₂)_m;
- R is H, CH₃, C_nH_{2n+1} (n=1-10), iso-OC₃H₇, C₆H₅, or CH₂C₆H₅;
- w = 0-6, provided that m+w ≤8; and
- E is H, C₁ – C₄ alkyl, C₁ – C₄ alkoxy, C₆H₅, CH₂C₆H₅, or F, Cl, Br.

15 8. The ophthalmic or otorhinolaryngological device of Claim 7 wherein the self-reinforced polymeric material is made by radical polymerization of the monofunctional acrylate or methacrylate monomer of formula (1) and the difunctional acrylate or methacrylate cross-linking monomer in the presence of the cross-linked acrylate, or methacrylate microsphere of formula (2).

20 9. The ophthalmic or otorhinolaryngological device of Claim 7 wherein the difunctional acrylate or methacrylate cross-linking monomer (b) is selected from the group consisting of ethylene glycol dimethacrylate; diethylene glycol dimethacrylate; allyl methacrylate; 1,3-propanediol dimethacrylate; 2,3-propanediol dimethacrylate; 1,6-hexanediol dimethacrylate; 1,4-butanediol dimethacrylate; CH₂=C(CH₃)C(O)O(CH₂CH₂O)_n-C(O)C(CH₃)=CH₂ where n = 1 – 50; CH₂=C(CH₃)C(O)O(CH₂)_tO-C(O)C(CH₃)=CH₂ where t= 3 – 20; and their corresponding acrylates.

10. The ophthalmic or otorhinolaryngological device of Claim 7 wherein the self-reinforced polymeric material comprises 75 - 98% (w/w) of the monofunctional acrylate or methacrylate monomer of formula (1), 0.1 - 5 %
5 (w/w) of the difunctional acrylate or methacrylate cross-linking monomer, and 1 – 20 % (w/w) of the cross-linked acrylate or methacrylate microsphere of formula (2).

11. The ophthalmic or otorhinolaryngological device of Claim 10 wherein
10 the self-reinforced polymeric material comprises 1 – 5 % (w/w) of the cross-linked acrylate or methacrylate microsphere of formula (2).

12. The ophthalmic or otorhinolaryngological device of Claim 11 wherein
15 the self-reinforced polymeric material further comprises an ingredient selected from the group consisting of reactive UV absorbers and reactive blue-light absorbers.

13. The ophthalmic or otorhinolaryngological device of Claim 7 wherein the self-reinforced polymeric material comprises 65 – 70 % (w/w) of 2-phenylethyl acrylate, 25 – 33% (w/w) of 2-phenylethyl methacrylate, 1 – 4 % (w/w) of cross-linked 2-phenylethyl methacrylate microspheres having an average diameter 0.1 – 1 µm, and 0.5 –1.5 % (w/w) of a difunctional acrylate or methacrylate cross-linking monomer.
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